CLAIMS

What is claimed is:

1. A method of diagnosing HIV infection in a subject comprising:

   a. obtaining a biological sample from said subject;

   b. determining the increased expression of a SHIVA in said biological sample.

2. The method of claim 1, wherein said cell sample contains cells selected from the group consisting of macrophages, neuronal cells, central nervous system cells, microglial cells, glial cells, T-cells, and B-cells.

3. The method of claim 1, wherein said SHIVA protein comprises a sequence of SEQ ID NO:2.

4. The method of claim 1, wherein said SHIVA protein is a 6kDa fragment of the protein of SEQ ID NO:2.

5. The method of claim 1, wherein said determining comprising assaying for the presence of a nucleic acid that encodes said SHIVA protein in said sample.

6. The method of claim 5, further comprising subjecting said sample to conditions suitable for amplifying said nucleic acid.

7. The method of claim 1, wherein said determining comprises contacting said sample with an antibody that binds immunologically to a SHIVA protein.

8. The method of claim 7, further comprising subjecting the sample to ELISA.

9. The method of claim 1, further comprising the step of comparing the expression of SHIVA with the expression of SHIVA in a non-HIV infected sample.

10. The method of claim 9, wherein said comparing comprises evaluating the level of expression of SHIVA.

11. The method of claim 9, wherein said comparing comprises evaluating the structure of the SHIVA gene, protein or transcript.

12. The method of claim 11, wherein said evaluating comprises performing an assay selected from the group consisting of sequencing, nucleic acid hybridization, PCR, RNAase protection.

13. The method of claim 12, wherein said nucleic acid hybridization assay is performed using a microarray comprising oligonucleotides derived from the sequence of SEQ ID NO:1.

14. The method of claim 13, wherein said oligonucleotides are each at least 20 bases in length.

15. A composition comprising an isolated polypeptide encoding a SHIVA protein having the sequence of SEQ ID NO:2 and an immunological adjuvant, or pharmaceutically acceptable carrier or diluent.

16. The composition of claim 15, further comprising a combination of one or more competitive inhibitor of apartyl protease, one or more nucleoside substrate reverse transcriptase inhibitor, or one or more non-nucleoside reverse transcriptase inhibitors

17. The composition of claim 16, wherein said competitive inhibitor of aspartyl protease is selected from the group consisting of saquinavir, indinavir, ritonavir, nelfinavir and amprenavir.

18. The composition of claim 16, wherein said nucleoside substrate reverse transcriptase inhibitor is selected from the group consisting of zidovudine, didanosine, stavudine, lamivudine, zalcitabine and abacavir.

19. The composition of claim 16, wherein said non-nucleoside reverse transcriptase inhibitor is selected from the group consisting of nevaripine, delavaridine and efavirenz.

20. The composition of claim 15, wherein said polypeptide is conjugated to a carrier molecule or a tag.

21. The composition of claim 20, wherein said carrier molecule is selected from the group consisting of KLH, and BSA.

22. A monoclonal antibody that binds immunologically to a SHIVA protein.

23. The monoclonal antibody of claim 22, wherein said monoclonal antibody binds to a protein of SEQ ID NO:2 or a fragment or variant thereof.

24. The monoclonal antibody of claim 23, wherein said monoclonal antibody binds to a 6kDa fragment of the protein of SEQ ID NO:2.

25. The monoclonal antibody of claim 24, wherein said monoclonal antibody neutralizes the biological activity of the 6kDa fragment of the protein of SEQ ID NO:2.

26. The monoclonal antibody of claim 22, wherein said monoclonal antibody does not bind immunologically to other human polypeptides.

27. The monoclonal antibody of claim 22, wherein said monoclonal antibody binds to non-human homologs of SHIVA.

28. The monoclonal antibody of claim 22, wherein said monoclonal antibody further comprises a detectable label.

29. The monoclonal antibody of claim 28, wherein said detectable label is selected from the group consisting of a fluorescent label, a chemiluminescent label, a radiolabel and an enzyme.

30. The monoclonal antibody of claim 22, wherein said monoclonal antibody is formulated into a pharmaceutical composition.

31. The monoclonal antibody of claim 22, wherein said monoclonal antibody is formulated into a diagnostic kit, said kit further comprising instructions for performing a diagnostic assay to determine the presence of an SHIVA protein.

32. A hybridoma cell that produces a monoclonal antibody that binds immunologically to a SHIVA protein.

33. The hybridoma cell of claim 32, wherein said hybridoma produces a monoclonal antibody that does not bind to other human proteins.

34. The hybridoma cell of claim 32, wherein the antibody binds to a non-human homolog of a protein of SEQ ID NO:2.

35. A polyclonal antisera comprising antibodies which bind immunologically to a SHIVA protein.

36. A nucleic acid construct comprising a polynucleotide of SEQ ID NO:1 operably linked to a heterologous promoter.

37. The nucleic acid construct of claim 36, wherein said heterologous promoter is selected from the group consisting of CMV, RSV, SV40, UbC, EF1alpha, and tetracycline inducible promoter.

38. The nucleic acid construct of claim 36, wherein said polynucleotide is positioned in an antisense orientation with respect to the heterologous promoter.

39. The nucleic acid construct of claim 36, further comprising the nucleic acids of a viral vector selected from the group consisting of retrovirus, adenovirus, adeno-associated virus, herpes virus, and vaccinia virus.

40. The nucleic acid construct of claim 36, wherein said nucleic acid construct is packaged in a liposome.

41. A method of altering apoptosis in a first cell, comprising altering the expression or processing of SHIVA protein in a second cell.

42. The method of claim 41, wherein said second cell is an HIV-infected cell, said first cell is a neuronal cell, and said altering comprises decreasing apoptosis in said first cell by inhibiting the expression or activity of SHIVA protein in said HIV-infected second cell.

43. The method of claim 41, wherein said second cell is an HIV-infected cell, said first cell is a B cell or a T cell, and said altering comprises decreasing apoptosis in said first cell by inhibiting the expression or activity of SHIVA protein in said HIV-infected second cell.

44. The method of claim 43, wherein said first cell is co-treated with HAART.

45. The method of claim 42, wherein apoptosis is decreased within said HIV-1 infected second cell.

46. The method of claim 42, wherein apoptosis is decreased in cells surrounding said HIV-1 infected second cell.

47. The method of claim 41, wherein said first cell is a hyperproliferative cell and said altering comprises increasing cell apoptosis in said first cell by increasing the expression, processing or activity of SHIVA protein in said second cell.

48. The method of claim 47, wherein apoptosis is increased within said second cell.

49. The method of claim 47, wherein apoptosis is increased in cells surrounding said second cell.

50. The method of claim 41, wherein said method is performed in an *in vitro* assay.

51. The method of claim 41, wherein said first cell and said second cell are located within a mammalian organism and the method is performed *in vivo*.

52. The method of claim 42, wherein said inhibiting the expression of SHIVA in said second cell comprises contacting SHIVA produced by said second cell with an agent that binds to and/or inactivates said SHIVA.

53. The method of claim 42, wherein said inhibiting the expression of SHIVA in said second cell comprises contacting said second cell with a nucleic acid construct that reduces the expression of SHIVA in said second cell.

54. The method of claim 52, wherein said agent is a small molecule inhibitor, or an antibody preparation.

55. A method of ameliorating inflammatory disease in an individual comprising administering to said individual a composition comprising SHIVA, in an amount effective to deplete B-cells and/or T-cells in said individual.

56. The method of claim 55, wherein said B-cells and/or T cells are depleted as a result of apoptosis.

57. A transgenic non-human animal, wherein the neuronal cells of said animal comprises a gene, that encodes an SHIVA protein, under the control of a neuron-specific promoter.

58. The transgenic non-human animal of claim 57, wherein said animal exhibit dementia.

59. A recombinant host cell, wherein said cell is transformed with an expression construct comprising a nucleic acid that encodes SHIVA under the control of a promoter.

60. The recombinant host cell of claim 59, wherein said cell is a neuronal cell.

61. The recombinant host cell of claim 59, wherein said cell is a macrophage.

62. The recombinant host cell of claim 59, wherein said cell further expresses one or more HIV-related genes selected from the group consisting of tat, nef, rev, vpr, vpu, env, pol, gag, and vpf.

63. The recombinant host cell of claim 59, wherein said cell has been transformed to express said one or more HIV-related genes.

64. The recombinant host cell of claim 59, wherein said expression construct further comprises nucleic acids sequences of said one or more HIV-related genes.

65. A method of treating a subject having HIV-associated dementia comprising administering a composition according to claim 15.

66. A method of determining the efficacy of an HIV treatment regimen comprising monitoring the expression of SHIVA in the subject receiving the HIV treatment prior to and after said treatment wherein a decrease in the expression of SHIVA after said treatment indicates that the treatment was effective in alleviating the symptoms of HIV infection.

67. A method for screening for agents that modulate apoptosis comprising:

a. providing a cell that expresses SHIVA;

b. contacting said cell with a candidate modulator; and

c. monitoring a change in the expression or activity of SHIVA that occurs in the presence of said modulator.

68. The method of claim 67, wherein said monitoring step comprises comparing the level of expression of said SHIVA in the presence of said modulator with the level of expression of said SHIVA in the absence of said modulator.

69. The method of claim 67, wherein said monitoring step comprises determining the level of secretion of a 6kDa fragment of SHIVA in the presence of said

modulator with the level of secretion of said 6kDa fragment of SHIVA in the absence of said modulator.

70. The method of claim 67, wherein said monitoring step comprises comparing apoptosis of cells surrounding said cell in the presence of said modulator to the level of apoptosis of surrounding cells in the absence of said cell.

71. The method of claim 67, wherein said cell that expresses said SHIVA is a macrophage or microglial cell.

72. The method of claim 70, wherein said surrounding cells is a cell selected from the group consisting of a neuronal cell, a B-cell and a T-cell.

73. The method of claim 67, wherein said cell that expresses said SHIVA has been derived from a HIV-infected patient.

74. The method of claim 67, wherein said cell that expresses said SHIVA is a recombinant host cell according to claim 59.

75. The method of claim 67, wherein said contacting is performed *in vitro*.

76. The method of claim 67, wherein said cell that expresses said SHIVA is located within a mammalian organism and the screening method is performed *in vivo*.

77. The method of claim 67, wherein said cell that expresses said SHIVA is part of a transgenic, non-human animal.

78. The method of claim 67, wherein said candidate modulator is a nucleic acid construct that reduces the expression of SHIVA.

79. The method of claim 67, wherein said candidate modulator is an antibody.

80. The method of claim 79, wherein said antibody is a monoclonal antibody.

81. A composition comprising a candidate modulator of apoptosis identified according to a method of any one of claims 67.

82. A kit for determining the presence of a SHIVA protein in a sample, said kit comprising a monoclonal antibody of claim 22, and a composition comprising an SHIVA protein.

83. An apoptotic protein comprising the sequence of SEQ ID NO:3.

84. A nucleic acid that encodes the protein of claim 83.

85. An expression vector that comprises the nucleic acid of claim 84.

86. A host cell transformed with the expression vector of claim 85.